AGRICULTURAL ELECTRICITY
Curriculum Content Framework

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Curriculum Content Framework

Agricultural Electricity

Grade Levels: 10, 11, 12 **Course Code: 491040**	**Prerequisites: Agriculture Science and Technology or Agriculture Science**

Course Description: Students will cover electrical terms, careers, sources, tools and practical wiring. Students will learn to read plans and wire according to plan. They will use hands-on activities and safety will be stressed.

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Unit 1: Safety
2 Hours

Terminology: AFCI, Conductor, Insulator, GFCI, NEC, OSHA, Safety, UL

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** **What the Instruction Should Reinforce**		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
1.1 List appropriate clothing for safety	1.1.1 Select appropriate clothing material from samples	Thinking	Decision Making	Accepts responsibility for decisions [4.2.1]
1.2 Define safety terms		Foundation	Listening	Listens for content [1.2.3] Receives and interprets verbal messages [1.2.8]
			Reading	Applies/Understands technical words that pertain to subject [1.3.6] Follows written directions [1.3.13]
1.3 List precautions to avoid personal injury		Thinking	Decision Making	Considers risk when making a decision [4.2.3] Generates options/alternatives [4.2.6]

Unit 2: Identification of Equipment and Tools
5 Hours

Terminology: no terms

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
2.1 Identify electrical hand tools	2.1.1 Lay out tools in the shop to study	Foundation	Listening	Listens for content [1.2.3]
	2.1.2 Develop a tool ID Board	Thinking	Creative Thinking	Uses imagination to create new ideas [4.1.1]
2.2 Identify electrical devices (switches, outlets, etc.)	2.2.1 Lay out electrical devices in the shop to study	Foundation	Listening	Listens for content [1.2.3]
	2.2.2 Develop an electrical device board	Thinking	Creative Thinking	Uses imagination to create new ideas [4.1.1]
2.3 Identify components of a Service Entrance Panel	2.3.1 Lay out SEP components in the shop to study	Foundation	Listening	Listens for content [1.2.3]
2.4 Identify cables, wires, and conduit	2.4.1 Lay out cables, wire and conduit in the shop to study	Foundation	Listening	Listens for content [1.2.3]
	2.4.2 Develop a board identifying cables, wires, and conduit	Thinking	Creative Thinking	Uses imagination to create new ideas [4.1.1]
2.5 Identify connectors	2.5.1 Lay out connectors in the shop to study	Foundation	Listening	Listens for content [1.2.3]
	2.5.2 Develop a connector board	Thinking	Creative Thinking	Uses imagination to create new ideas [4.1.1]

Unit 3: Measuring Electricity
4 Hours

Terminology: Ampere, Cycle, Horse power, Kilowatthour, Kilowatts, Ohm, Ohm's law, Single phase, Three phase, Volts (V), Watt (W)

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
3.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
3.2 Calculate electrical rates	3.2.1 Solve an electrical rate problem	Foundation	Math	Applies addition, subtraction, and division to real-world situations [1.1.1] Calculates measurements taken from measuring devices [1.1.9] Computes using a formula [1.1.14]
		Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]
3.3 Describe the relationship between volts (V), watts (W), and amps (A) - (Ohm's Law)		Foundation	Math	Applies addition, subtraction, and division to real-world situations [1.1.1]
			Reading	Applies/Understands technical words that pertain to a subject [1.3.6]

3.4 Calculate electrical load	3.4.1 Calculate and discuss items that affect electrical usage	Foundation	Math	Applies addition, subtraction, and division to real-world situations [1.1.1]
			Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
		Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]

Unit 4: Wire Selection and Connection
4 Hours

Terminology: Armored Cable, Ampacity, Cable, Non-metallic Box, Non-metallic sheathed cable, Non-metallic sheathed cable corrosive resistance, Underground Feeder, Underground Service Entrance, Voltage Drop

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
4.1 State the various types of wire insulation and their uses	4.1.1 Visually observe the different insulation types	Foundation	Listening	Listens for content [1.2.3]
			Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]
4.2 State the different types of cables and their uses	4.2.1 Observe cable types	Foundation	Listening	Listens for content [1.2.3]
	4.2.2 Prepare a report on the uses of cables		Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]
4.3 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
4.4 Memorize or indicate the relationship between wire size and amperage		Foundation	Listening	Listens for content [1.2.3]
			Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
4.5 List the causes of voltage drop	4.5.1 Demonstrate voltage drop using a voltmeter (OHM meter)	Foundation	Listening	Listens for content [1.2.3]
			Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
4.6 Compare copper conductors to other conductors	4.6.1 View various conductors	Foundation	Listening	Listens for content [1.2.3]
			Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]

Unit 5: Circuit Protection and Planning
5 Hours

Terminology: Branch circuit, Breakers, Circuit, Feeder circuit, Fuses, General lighting circuit, Individual circuit, Motor circuit, Parallel circuit, Series circuit, Small appliance circuit

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
5.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
5.2 List the various circuit protection devices		Foundation	Listening	Listens for content [1.2.3]
			Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]
5.3 Discuss different types of circuits (feeder, branch, appliance, individual, GPC)		Foundation	Listening	Listens for content [1.2.3]
			Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]

Unit 6: Grounding Safety
3 Hours

Terminology: Arc fault circuit interrupter, Continuous ground, Ground fault circuit interrupter, Ground wire, Grounded wire, Grounding wire, Milliampere, Surge suppressors

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
6.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
6.2 Cover the types of GFCI and their functions		Foundation	Reading	Uses appropriate materials and techniques as specified [1.3.20]
		Thinking	Reasoning	Extracts rules or principles from written information [4.5.4]
6.3 Discuss the code requirements for GFCI and AFCI		Foundation	Speaking	Applies/Uses technical terms as appropriate to audience [1.5.2]
		Thinking	Reasoning	See relationship between two or more ideas, objects, or situations [4.5.5]
6.4 Identify locations needed for surge protectors		Foundation	Reading	Identifies relevant details, facts, and specifications [1.3.16]
				Interprets drawings to obtain factual information [1.3.17]
		Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]

Unit 7: Service Entrance Panel (SEP)
4 Hours

Terminology: Ground clamp, Ground rod, Meter base, Service entrance panel, Service entrance cable, Service head, Service insulators

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
7.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
7.2 Explain the components of SEP		Foundation	Speaking	Applies/Uses technical terms as appropriate to audience [1.5.2] Speaks in a clear, concise manner [1.5.12]
7.3 Distinguish between 120V and 240 V service		Thinking Foundation	Reasoning Listening	See relationship between two or more ideas, objects, or situations [4.5.5] Listens for content [1.2.3] Receives and interprets verbal messages [1.2.8]
7.4 Calculate load for an agricultural structure		Foundation	Arithmetic/ Mathematics	Applies a mathematical formula to solve a problem [1.1.3] Calculates different units of measurement [1.1.6] Performs basic computations [1.1.31]

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
7.5 Discuss overhead clearance for service wires		Foundation	Listening Science Reading Speaking	Comprehends ideas and concepts related to…. [1.2.1] Follows safety guidelines [1.4.15] Comprehends written information for main ideas [1.3.7] Communicates a thought, idea, or fact in spoken form [1.5.5]
7.6 Discuss grounding requirements for service		Foundation	Speaking Writing	Applies/Uses technical terms as appropriate to audience [1.5.2] Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6] Uses technical words and symbols [1.6.20]
7.7 Discuss emergency hook-up of generators		Foundation	Speaking Writing	Applies/Uses technical terms as appropriate to audience [1.5.2] Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6] Uses technical words and symbols [1.6.20]

Unit 8: Outlet and Switch Boxes
4 Hours

Terminology: Bar-hanger, Fixture stud, Knock-outs, Knock-out seal

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
8.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
8.2 Name the types of electrical boxes (handy box, etc.)		Foundation	Speaking Writing	Applies/Uses technical terms as appropriate to audience [1.5.2] Applies/Uses technical words and concepts [1.6.4]
8.3 Name the materials boxes are made of		Foundation	Speaking	Applies/Uses technical terms as appropriate to audience [1.5.2]
8.4 List the requirements for installing boxes		Thinking	Decision Making	Demonstrates decision making skills [4.2.4]
8.5 Identify the different face plates for boxes		Foundation	Listening	Listens for content [1.2.3]

Unit 9: Switches and Outlets
5 Hours

Terminology: 240 Volt outlet, Clock outlet, Dimmer switches, Duplex-outlet with ground, Duplex outlet without ground, Four-way switch, Ground plug adaptor, Keyless receptacle, Single-pole switch, Three-way switch

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
9.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
9.2 Identify the different kinds of outlets and switches		Foundation	Listening	Listens for content [1.2.3]
9.3 Discuss the basic uses of the three kinds of switches		Foundation	Speaking	Communicates a thought in spoken form [1.5.5]
9.4 Discuss the capacity (amps) of switches and outlets		Foundation	Speaking	Communicates a thought in spoken form [1.5.5]

Unit 10: Conduit
4 Hours

Terminology: Bushing, Conduit bender, Connector, Coupling, Electrical metallic tubing, Electrical non-metallic tubing, Flexible metal conduit, Intermediate metal conduit, Liquid tight conduit, Lock nut, Rigid metal conductor

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
10.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
10.2 Identify the different types of conduit		Foundation	Reading	Analyzes and applies information and concepts derived from printed materials [1.3.2]
			Listening	Evaluates oral information/presentation [1.2.2]
		Thinking	Decision Making	Evaluates information/data to make best decisions [4.2.5]
10.3 List the various applications of conduit installation		Foundation	Reading	Analyzes and applies information and concepts derived from printed materials [1.3.2]
		Thinking	Problem Solving	Demonstrates logical reasoning to reach a conclusion [4.4.2]
				Interprets drawings to solve design problems [4.4.7]

Unit 11: Electric Motors
5 Hours

Terminology: 3-phase motor, Capacitor, Horsepower, Name plate, Repulsion-Induction motor, Single phase motor, Split phase motor, Universal motor

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
11.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
11.2 Discuss the types of electric motors		Foundation	Reading Science	Uses standard occupational resource materials [1.3.22] Describes/Explains scientific principles related to…..[1.4.13]
11.3 Discuss the use of electric motors		Foundation Thinking	Reading Decision Making	Analyzes and applies what has been read to specific task [1.3.2] Comprehends ideas and concepts related to…..
11.4 List the components or information found on the electric motor nameplate		Thinking	Problem Solving	Recognizes/Defines problem [4.4.8]
11.5 Demonstrate electric motor maintenance		Foundation	Listening	Comprehends ideas and concepts [1.2.1]
11.6 Calculate pulley/speed ratio		Foundation	Arithmetic/Math	Applies math formula to solve a problem [1.1.3]

Unit 12: Diagramming
15 Hours

Terminology: Energized wire, Grounding wire, Neutral wire, Parallel circuit, Series circuit, Split circuit, Split-wired duplex receptacle, Switch loop

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
12.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
12.2 Discuss colors used in diagrams		Foundation	Listening Writing	Listens for content [1.2.3] Analyzes data, summarizes results, makes conclusions [1.6.2]
12.3 Discuss proper labeling of wire size, SEP info, wire type		Foundation Thinking	Listening Reasoning	Listens for content [1.2.3] Uses logic to draw conclusions from available information [4.5.6]
12.4 Diagram circuits for residential and farm wirings		Thinking	Problem Solving	Draws conclusions from what is read and gives possible solutions [4.4.4]

Unit 13: Wiring
15 Hours

Terminology: no terms

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		**ACADEMIC and WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
13.1 Demonstrate the basic wiring splices		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]
		Foundation	Listening	Comprehends ideas and concepts related to wiring splices [1.2.1] Listens to follow directions [1.2.6]
13.2 Wire circuits for residential and farm wirings		Thinking	Reasoning	See relationship between two or more ideas, objects, or situations [4.5.5]
		Foundation	Seeing Things in the Mind's Eye	Visualizes a system's operation from schematics [4.6.3]
			Science	Applies knowledge to complete a practical task [1.4.3]

Unit 14: Wiring Plans
15 Hours

Terminology: no terms

CAREER and TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC and WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
14.1 Identify electrical symbols		Foundation	Reading	Uses appropriate materials and techniques as specified [1.3.20]
			Science	Applies knowledge to complete a practical task [1.4.3]
14.2 Explain locations of switches, lights, and outlets on wiring plans		Foundation	Science	Applies knowledge to complete a practical task [1.4.3]
14.3 Discuss the different kinds of branch circuits found on wiring plans		Foundation	Reading	Uses appropriate materials and techniques as specified [1.3.20]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
			Science	Applies knowledge to complete a practical task [1.4.3]
14.4 List proper circuit name, amperage, wire size and type of various circuits		Thinking	Reasoning	See relationship between two or more ideas, objects, or situations [4.5.5]
14.5 Complete wiring plan activities of residential buildings and farm structures		Thinking	Reasoning	See relationship between two or more ideas, objects, or situations [4.5.5]
			Science	Applies knowledge to complete a practical task [1.4.3]

Glossary

Unit 1: Safety

1. AFCI - Arc Fault Circuit Interrupter
2. Conductor - any material that will permit electrons (electricity) to move through it
3. GFCI - Ground Fault Circuit Interrupter
4. Insulator - material that provides great resistance to the flow of electricity
5. NEC - National Electric Code
6. OSHA - Occupational Safety and Health Act
7. Safety - freedom from accidents
8. UL - Underwriters Laboratory

Unit 2: Identification of Equipment and Tools

(No terms to define)

Unit 3: Measuring Electricity

1. Ampere (A) (amp) — a measure of the rate of flow of current in a conductor

2. Cycle - in alternating current, the time is usually $1/60^{th}$ of a second, during which the voltage goes from zero to + maximum, back
    a. through zero – minimum and back to zero again

3. Horse power - force needed to lift 550 pounds one foot in one second

4. Kilowatthour - the use of 1000 watts for one hour

5. Kilowatts (kw) - 1000 watts

6. Ohm - a measure of the resistance of a material to the flow of electrical current

7. Ohm's law - the relationship between electric current (I), electromotive force (E), and resistance
    a. (R): E=IR

8. Single phase - the current produced from a single alternating source, using two wires (120-volt
    a. only) or three wires (120/240 volts)

9. Three phase - current produced from three separate alternating sources, each in a different phase
    a. or cycle

10. Volts (V) - a measure of electrical pressure

11. Watt (W) - —a measure of energy available or work that can be done using one ampere at one volt

Unit 4: Wire Selection and Connection

1. Ampacity - the safe current carrying capacity of a wire in amps

2. Armored cable (AC) - two or more conductors, paper wrapped, enclosed in a flexible, spiral interlocked armor of steel or aluminum, often referred to as “BX”

3. Cable - an assembly of two or more wires as in non-metallic sheathed or armored cable

4. Non-metallic box (NMB) - a box made of non-metallic material (ex. Plastic)

5. Non-metallic sheathed cable corrosive resistant (NMC) - (often called Romex). A type of cable which can be used in damp corrosive locations

6. Non-metallic sheathed cable (NM) - (often called Romex) a type of cable which can only be used in dry locations

7. Underground feeder (UF) - wire which may be buried directly into the earth and must be protected by a fuse or breaker at the source

8. Underground service entrance (USE) - a cable which may be buried directly into the earth without a breaker or fuse protection

9. Voltage Drop - the loss of voltage in a wire between a source and it’s intended use

Unit 5: Circuit Protection and Planning

1. Branch circuit - wiring that connects an outlet or group of outlets to the last fuse or circuit breaker

2. Breakers - an overcurrent device which automatically opens a circuit if a predetermined number of amps flows through it

3. Circuit - arrangement of conductors, devices, and utilization equipment (loads) such that current will pass through it

4. Feeder circuit - a circuit extending between the service equipment and the final branch circuit and the overcurrent device.

5. Fuses - soft metal link that melts and opens a circuit at a predetermined level of overcurrent. Fuses are enclosed in a convenient case that contains the melted metal when a fuse blows, making replacement easy.

6. General lighting circuit - circuits which are dedicated to lights and receptacles

7. Individual circuit - circuit which serves individual appliances such as a range and clothes dryer

8. Motor circuit - a circuit which serves individual motors over $1/8^{th}$ horsepower that are not apart of an appliance

9. Parallel circuit - connection of two or more devices or loads across the same conductors of the circuit, current flows through each being independent of the others

10. Series circuit - connection of two or more devices or loads in tandem so that the current flowing through each also flows through all the others. Rarely used in residential and farm wiring

11. Small appliance circuit - circuits which serve only small appliance outlets including refrigeration equipment in the kitchen, pantry, breakfast room, and dining room.

Unit 6: Grounding Safety

1. Arc fault circuit interrupter (AFCI) - device that will open the circuit path if an arc occurs between two circuit wires

2. Continuous ground - the bare un-insulated grounding wire which must be carried from outlet to outlet with no interruptions in the wire

3. Ground fault circuit interrupter (GFCI) - device which will disconnect in as little as $1/40^{th}$ of a second if a predetermined number of milliamperes flows through it

4. Ground wire - the wire that is bonded within the service equipment closure to the neutral conductor and the equipment grounding conductor and connects them to the grounding electrode system

5. Grounded wire - the wire (usually white) that carries current and is connected to the ground at the service equipment. It is not fused or protected in any way

6. Grounding wire - the wire that is bonded within the service equipment enclosure to the neutral conductor and connects them to the grounding electrode system

7. Milliampere - $1/1000^{th}$ of an ampere

8. Surge suppressors - device which protects sensitive electronic equipment against voltage surges

Unit 7: Service Entrance Panel

1. Ground clamp - a clamp which connects the grounding wire to the ground rod

2. Ground rod - a rod at least 5/8 inches in diameter driven at least 8 feet into the ground to provide a ground connection to the earth

3. Meter base - the socket which is usually provided by the power supplier and installed 5 feet above the ground which houses the electrical meter

4. Service entrance cable - the cable used to bring wires into the building. It runs from the service head to the service entrance panel

5. Service entrance panel (SEP) - the panel which is the main fixed control and cutoff of the electrical supply consisting of breakers or fuses and connected to the load end of the service conductors in a building

6. Service head (entrance cap or weather head) - located on top of the service entrance to protect the installation from excess moisture

7. Service insulators - insulators located on the outside of the building which is the point where the power supplier's wires stop. They should be located as high as practical but lower than the service head

Unit 8: Outlet and Switch Boxes

1. Bar-hanger - an adjustable bar which has a fixture stud sliding on it that is used when a box must be mounted between studs or joists
2. Fixture stud - used to support heavy fixtures which need to be supported independent of the box
3. Knock-out seal - insert used to plug a previously removed knock-out
4. Knock-outs - circular pieces of metal located on boxes which may be removed to permit wires to enter the box

Unit 9: Switches and Outlets

1. 240 volt outlet - point on a wiring system at which a 240 volt device or extension cord may be connected
2. Clock outlet - specially designed receptacle with a recessed face used for mounting clocks
3. Dimmer switches - device which allows for control of the brightness of a light
4. Duplex-outlet with ground - an electrical device consisting of a pair of receptacles on a single yoke with a third opening for a ground wire
5. Duplex outlet without ground - an electrical device consisting of a pair of receptacles on a single yoke without a third opening for a ground wire
6. Four-way switch - device for turning electrical equipment on or off from more than two locations
7. Ground plug adaptor - known as a two-to-three wire adaptor. It allows for the connecting of three wire plugs to be used in a duplex, non-grounded receptacle
8. Keyless receptacle - a lamp holder that anchors to an octagon box, round box, for incandescent light bulbs
9. Single-pole switch - device for turning electrical equipment on or off from one location
10. Three-way switch - device for turning electrical equipment on or off from two locations

Unit 10: Conduit

1. Bushing - used to fasten conduit to boxes. It is used on the inside of the box
2. Conduit bender - device used to bend conduit and prevents the collapsing of the conduit
3. Connector - used to connect EMT conduit using a pressure fitting
4. Coupling - connector used to connect EMT conduit using a set-screw
5. Electrical metallic tubing (EMT) - known as thin-walled tubing, may be used either indoors or outdoors and cannot be threaded
6. Electrical non-metallic tubing (ENT) - made of PVC with a corrugated wall construction that allows it to be bent by hand without the application of heat
7. Flexible metal conduit (FMC) - commonly referred to as “Greenfield” or “Flex”. It is used when flexibility or movement is required such as an electric motor circuit.
8. Intermediate metal conduit (IMC) - type of conduit which has a slightly smaller wall thickness than RMC and may be threaded
9. Liquid tight conduit - may be made of metallic or non-metallic material and is used in areas where moisture may be present
10. Lock nut - used to fasten conduit to boxes. It is used on the outside of the box
11. Rigid metal conduit (RMC) - a thick-walled conduit, which size-for-size has the same dimensions as standard water pipe, and may be threaded

Unit 11: Electric Motors

1. Capacitor motor - motor which contains a capacitor or condenser that enables it to start heavy loads
2. Horsepower - force needed to lift 550 pounds one foot in one second
3. Name plate - a plate located on the motor which contains the necessary information for installation, repair, and maintenance of an electrical motor
4. Repulsion-Induction motor - motor with a very high starting capacity, used for heavier jobs. It will “break loose” almost any kind of hard starting machine
5. Single phase motor - motor that runs off of 120/240 volts, single phase current
6. Split phase motor - simple type of motor that does not contain brushes or a commutator and draws very heavy amperage while starting
7. Three phase motor - simplest and most trouble free and operates on three phase current
8. Universal motor - motor that may be used on alternating current (AC) or direct current (DC)

Unit 12: Diagramming

1. Energized wire - any current carrying wire (black, white, or red)

2. Grounding wire - wire in a circuit which must be connected to every metal box and device on a circuit to ensure the safety of the circuit. It may be bare, green or green with yellow stripes

3. Neutral wire - also known as the grounded wire. It is white in color and runs to every device on the circuit except switches

4. Parallel circuit - connection of two or more devices or loads across the same conductors of the circuit, current flow through each being independent of the others

5. Series circuit - connection of two or more devices or loads in tandem so that the current flowing through each also flows through all the others. Rarely used in residential and farm wiring

6. Split circuit - an outlet where each half is controlled by separate circuit breakers

7. Split wired duplex receptacle - receptacle where one half is energized constantly and the other is controlled by a switch

8. Switch loop - wire between a switch and the device it is controlling

Unit 13: Wiring

(No terms to define)

Unit 14: Wiring Plans

(No terms to define)